A. GENERAL INFORMATION

Project Name:		**Date:**	
Project Location:		**Compliance Method:**	
CA City:		**Building Front Orientation (deg or cardinal):**	
Zip Code:		**Number of Dwelling Units:**	
Climate Zone:		**Fuel Type:**	
Building Type	☐ Single Family ☐ Multi Family	**Total Conditioned Floor Area (Addition):**	
Project Type:	Addition ☐ ≤ 300 ☐ > 300 to ≤ 400 ☐ > 400 to ≤ 700 ☐ > 700 to ≤ 1000	**Slab Area:**	

B. OPAQUE SURFACE DETAILS – Framed (Section 150.2(a))

1	2	3	4	5	6	7	8	9	10	11
Tag/ID	Assembly Type	Frame Type	Frame Depth	Frame Spacing	Appendix JA4 Reference	Cavity R-value	Continuous Insulation R-value	U-Factor	Required U-Factor from Package A	Comments

C. OPAQUE SURFACE DETAILS – Non-framed (Section 150.1(c)1)

1	2	3	4	5	6	7	8	9	10
Tag/ID	Assembly Type	Assembly Materials	Thickness	Interior or Core Insulation R-value	Continuous Insulation R-value	Appendix JA4 Reference	U-Factor	Required U-Factor from Package A	Comments

D. OPAQUE SURFACE DETAILS – Mass Walls (Section150.1(c)1)

1	2	3	4	5	6		7		8	9	10		11	
					Interior Insulation		Exterior Insulation		Appendix JA4		Interior Insulation		Exterior Insulation	
Tag/ID	Walls Above Grade	Mass Type	Mass Thickness (inches)	Furring Strip Thickness (inches)	R-value	U-factor	R-value	U-factor	Table	Cell	Required R-value	Required U-factor	Required R-value	Required U-factor

E. SLAB INSULATION (Table 150.1-A)

1	2	3	4	5	6
Floor Type	Proposed R-value	Proposed U-factor	Required Insulation R-value	Required Insulation U-factor	Comments

- Heated slab floors require mandatory slab insulation (see Table 110.8-A).

F. RADIANT BARRIER (Section 150.1(c)2)

A radiant barrier is required (for Climate Zones 2-15)

- *To meet the prescriptive requirement, a minimum free ventilation area of not less than one square foot of vent area for each 300 ft2 of attic floor area with 30 percent upper vent.*
- *A minimum air space between the top surface of the radiant barrier and roof decking of not less than 1.5 inches at the center of the truss/rafter span.*
- *Radiant Barrier shall be installed to cover all gable end walls and other vertical surfaces in the attic.*

G. ROOFING PRODUCTS (COOL ROOF) (Section 150.1(c)11)

1	2	3	4	5	6	7	8	9	10	11
Mass Roof 25 lb ft2 or greater	Roof Pitch	CRRC Product ID Number	Product Type	**Proposed**			**Minimum Required**			
				Aged Solar Reflectance	Thermal Emittance	SRI	Aged Solar Reflectance	Thermal Emittance	SRI	Comments

NOTES:

- Any roof area covered by building integrated photovoltaic panels and solar thermal panels are exempt from the above Cool Roof requirements.
- Liquid field applied coatings must comply with installation criteria from section 110.8(i)4.

H. FENESTRATION/GLAZING AREAS ALLOWED (Section 150.2(a)1)

1	2	3	4	5	6
	Greater of				
Azimuth	Maximum Allowed (based on percent of conditioned floor area)	Maximum Allowed ft2	U-factor	SHGC	Comments

I. FENESTRATION PROPOSED AREAS AND EFFICIENCIES (Section 150.2(a)1)

1	2	3	4	5	6	7	8	9	10	11	12
Fenestration Type	Frame Type	Azimuth	Proposed West Facing Area ft2	Proposed Non West Facing Area ft2	Total Proposed Area All Orientations	U-factor	Source	SHGC	Source	Exterior Shading Device	Comments

a	Added West-facing Fenestration Area	
b	Maximum Allowed West-facing Fenestration Area	
c	Is West-facing Fenestration Area ≤ Allowed	
d	Added Fenestration Area (all orientations)	
e	Maximum Allowed Fenestration Area (all orientations)	
F	Is Total Proposed Fenestration Area ≤ Allowed	
g	If exterior shading devices are used, what is the calculated value from WS-03	

J. HVAC SYSTEMS – NEW HEATING/COOLING (Section 150.1(c)7)

1	2	3	4	5	6	7	8
Alteration Type	Area to be heated/cooled (ft2)	Heating System Type	Heating Efficiency	Cooling System Type	Cooling Efficiency	Thermostat Type	Comments

- The Appliance Efficiency Standards regulate the minimum efficiency requirement of regulated appliances sold in California. Any new appliance legally offered for sale will meet the minimum efficiency required for prescriptive compliance.
- Central gas furnaces have a minimum efficiency of 78% AFUE, heat pumps 7.7 HSPF. While any gas heating appliance sold in California is acceptable for prescriptive compliance, the only types of electric systems allowed are heat pumps and mini-split heat pumps.
- Central cooling systems and heat pumps have a minimum efficiency of 13 SEER.

K. DUCT SYSTEMS (Section 150.2(b)1D)

1	2	3	4	5	6
Duct Alteration Type	Distribution System Type	Duct Location	Added Duct Length	Duct R-Value	Comments

- The prescriptive requirements preclude the use of bypass ducts in association with zonally controlled systems. A HERS Rater shall verify that zonally controlled systems have no bypass ducts.

L. WATER HEATING SYSTEMS (Section 150.2(a)1D for Additions)

1	2	3	4	5	6	7	8	8	10
Existing Fuel Type	Proposed Fuel Type	DHW Water Heater Type	Number of Added Water Heaters	Dwelling Unit Distribution Type	Water Heater Volume (gal)	Rated Input (Btuh)	Energy Factor	Required Water Heater Tank Exterior Insulation	Comments

M. WATER HEATING (Section 150.1(c)8 for New Construction)

1	2	3	4	5	6	7	8	9	10	11	12
Indicate Section 150.1(c)8 Requirement (paragraph A, B, C or D)	Water Heating System Type	DHW Water-Heater Type	Fuel Type	Dwelling Unit Distribution Type	Number of Water Heaters In System	Water Heater Volume (gal)	Rated Input (Btuh)	Energy Factor or Recovery Efficiency	Standby Loss (percent)	Water Heater Tank Exterior Insulation	Back-Up Solar Savings Fraction

N. HERS VERIFICATION SUMMARY The enforcement agency should pay special attention to the HERS Measures specified in this checklist below. A registered Certificate of Verification for all the measures specified shall be submitted to the building inspector before final inspection.

Ducts

- Duct leakage testing required (Residential Appendix RA3.1)
- Heating and cooling systems are ductless, no HERS verification required

Refrigerant Charge

- Refrigerant Charge Testing is required (Residential Appendix RA3.2) in climate zones 2 and 8-15
- No cooling system installed

Central System Air Handlers

- Airflow and Fan Efficacy (Residential Appendix RA3.3) or System Design
- No cooling system installed
- Non-ducted cooling system

O. DOCUMENTATION DECLARATION STATEMENT

- **I certify that this Certificate of Compliance documentation is accurate and complete.**

Name:	Signature:
Company :	Date:
Address:	If Applicable ☐ CEA or ☐ CEPE (Certification #):
City/State/Zip:	Phone:

Responsible Building Designer's Declaration Statement

- I am eligible under Division 3 of the California Business and Professions Code to accept responsibility for the building design identified on this Certificate of Compliance.
- I certify that the energy features and performance specifications for the building design identified on this Certificate of Compliance conform to the requirements of Title 24, Parts 1 and 6 of the California Code of Regulations.
- The building design features identified on this Certificate of Compliance are consistent with the information provided to document this building design on the other applicable compliance forms, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.

Name:	Signature:
Company:	Date:
Address:	License:
City/State/Zip:	Phone:

For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300.

CF-1R-ADD Prescriptive Instructions

Minimum requirements for prescriptive addition compliance can be found in Building Energy Efficiency Standards Section 150.2(a), and Table 150.1-A (Package A). Completing these forms will require that you have the Reference Appendices for the 2013 Building Energy Efficiency Standards, which contains the Joint Appendices used to determine climate zone and to complete the section for opaque surfaces. When the term CF-1R is used it means the CF-1R-PRSC-ADD-01. Worksheets are identified by their entire name and subsequently by only the worksheet number, such as WS-02.

Instructions for sections with column numbers and row letters are given separately.

If any part of the addition does not comply, prescriptive compliance fails and the performance (or computer) compliance approach must be used. Only the new construction is required to meet the requirements specified in this documentation. If any alterations to the existing building are occurring, those are documented on one or more of the CF-1R-ALT forms.

A. GENERAL INFORMATION

Project Name: Identifying information, such as owner's name.

Date: Date of document preparation.

Project Location: Legal street address of property or other applicable identifying information.

Compliance Method: Prescriptive.

CA City: Legal city/town of property.

Building Front Orientation: Building front expressed in degrees, where North = 0, East = 90, South = 180, and West = 270. Indicate cardinal if it is a subdivision or multi-family project that will be built in multiple orientations. The standards (section 100.1) include the following additional details for determining orientation:

- Cardinal covers all orientations (for buildings that will be built in multiple orientations);

- North is oriented to within 45 degrees of true north, including 45 degrees east of north;
- East is oriented to within 45 degrees of true east, including 45 degrees south of east;
- South is oriented to within 45 degrees of true south, including 45 degrees west of south;
- West is oriented to within 45 degrees of true west, including 45 degrees south of west.

Zip Code: 5-digit zip code for the project location (used to determine climate zone).

Number of Dwelling Units: 1 for single-family, 1 or more for multifamily.

Climate zone: From Joint Appendix JA2.1.1.

Fuel Type: Natural Gas, Liquefied Propane Gas, or Electricity. NOTE: prescriptive compliance only allows electricity if existing appliances are electric and natural gas is not available in the building.

Building Type: Single Family (includes duplex), or Multi Family (a building that shares common walls and common floors or ceilings).

Total Conditioned Floor Area: Enter the new conditioned floor area in ft2, as measured from the outside of exterior walls of the addition.

Project Type: Check the size of the addition as being 300 ft2 or less, greater than 300 up to 400 ft2, greater than 400 up to 700 ft2, or greater than 700 up to 1000 ft2.

Slab Area: Area of the first floor slab of the addition (if any) in ft2.

B. BUILDING INSULATION DETAILS (Section 150.2(b)1)

Additions of 700 ft2 or less require only R-13 wall insulation. Unless otherwise noted, all other requirements of Package A are required when using prescriptive compliance.

1. Tag/ID: A label (if any) from the plans, such as A1.4 or wall.
2. Assembly Type: Roof, Ceiling, Wall, Floor over crawlspace or floor over exterior.
3. Frame Type: Wood or Metal.

4. Frame Depth: Nominal dimensions of framing material such as 4 (if 2x4) or 6 (if 2x6).
5. Frame Spacing: 16 or 24 inches on center.
6. Appendix JA4 Reference: The Table number and cell (e.g., 4.2.1 A21 for an R-38 attic 24" on center framing). If assembly is not available in Appendix JA4, select EZ Frame and attach a CF-1R-PRSC-WS-01 (Worksheet for EZ Frame).
7. Cavity R-value. Insulation installed between framing.
8. U-factor: The U-factor for the entire wall, roof or floor assembly.

   NOTE: If using a weighted average of multiple assemblies to meet the required U-factor, attach form CF-1R-PRSC-WS-02, Area Weighted Average Calculation Worksheet.

9. Required U-factor: from Table 150.1-A.
10. Comments or notes regarding location or unique condition.

C. OPAQUE SURFACE DETAILS – Non-framed

1. Tag/ID: A label (if any) from the plans, for example, A1.4 or wall.
2. Assembly Type: Roof, Wall.
3. Assembly materials: SIP OSB, SIP I-Joist, see JA4 for guidance.
4. Thickness: Thickness in inches.
5. Interior or Core Insulation R-value: Insulation installed within the materials or on the inside. See Joint Appendix JA4 for guidance.
6. Continuous Insulation R-value: Insulation installed on the exterior. See Joint Appendix JA4 for guidance.
7. Appendix JA4 Reference: Table number, cell (column and row) (e.g., 4.3.2 A13). If assembly is not available on JA4, attach a WS-01.
8. U-factor: Proposed assembly U-factor from JA4 or WS-01. Must be less than or equal to column 9.
9. Required Assembly U-factor from Package A: Based on assembly type and climate zone.
10. Comments: Any notes regarding location, unique conditions, or attachments.

D. OPAQUE SURFACE DETAILS – Mass Walls

1. Tag/ID: A label (if any) from the plans, for example, A1.4 or wall.
2. Walls Above Grade: Yes or No.
3. Mass Type: ICF, Solid Masonry. See JA4 for guidance.

4. Mass Thickness: Thickness (in inches) of mass.
5. Furring Strip Thickness: If furring strips are required to meet the required R-value of U-factor, indicate the size (see JA4 Table 4.3.13 for guidance).
6. Interior Insulation R-value or U-factor: Enter either the R-value or U-factor of proposed insulation on the inside surface of the mass wall. See column 10 for the required insulation value for the wall type selected. See JA4 for guidance. Use the same descriptor (R-value or U-factor) throughout Table D.
7. Exterior Insulation R-value or U-factor: Enter either the R-value or U-factor of proposed insulation on the outside surface of the mass wall. See column 11 for the required insulation value for the wall type selected. See JA4 for guidance.
8. Appendix JA4 Table: Table number used to determine the R-value or U-factor (e.g., an ICF wall is 4.3.13).
9. Appendix JA4 Cell: Cell number used to determine the R-value or U-factor (e.g., an 8-inch thick ICF wall with 2 inches of EPS (R-15.4) is A6).
10. Interior Insulation: The required R-value or U-factor (whichever descriptor was selected in column 6) for interior insulation will be completed based on the Table 150.1-A requirements for the wall type.
11. Exterior Insulation: The required R-value or U-factor (whichever descriptor was selected in column 7) for exterior insulation will be completed based on the Table 150.1-A requirements for the wall type.

E. SLAB INSULATION

Slab edge performance specifications and installation criteria are found in Sections 150.0(l) and 150.1(c)1D (Table 150.1-A). Requirements vary by climate zone and slab conditions.

1. Floor type: Types include slab-on-grade or raised slab.
    - Slab-on-grade floors require slab edge insulation in climate zone 16 only.
    - Raised slab must be insulated to R8 in climate zones 1, 2, 11, 13, 14 and 16, R-4 in climate zones 12 and 15, and no insulation is required in climate zones 3-10.
2. Proposed R-value: When required, insulation can be specified by either R-value or U-factor. When specifying an R-value complete column 2.
3. Proposed U-Factor: When required, specify the U-factor of proposed insulation in column 3.
4. Required Insulation R-value: Whichever descriptor was used (R-value or U-factor) in column 2 or 3 will be used to specify the value required, which will vary by climate zone and type of slab. Values are from Table 150.1-A.

5. Required Insulation U-factor: Whichever descriptor was used (R-value or U-factor) in column 2 or 3 will be used to specify the value required, which will vary by climate zone and type of slab. Values are from Table 150.1-A.
6. Comments: Any notes regarding location, unique conditions, or attachments.

NOTE: A suggestion is provided to highlight that there is a mandatory slab edge insulation requirement for heated slab floors. Since mandatory requirements are not listed on the Certificate of Compliance, this is provided for information purposes only. The specific requirements are in Sections 110.8(g) and Table 110.8-A.

F. RADIANT BARRIER

Radiant barrier performance specifications and installation criteria are found in Sections 110.8(j) and 150.1(c)2, and in Residential Appendix RA4.2.1.

Radiant barriers are required by Package A in climate zones 2-15.

G. ROOFING PRODUCTS - COOL ROOF

Roofing requirements are found in Section 110.8(i) and 150.1(c)11. Depending on the climate zone and roof slope, a cool roof (defined as a minimum aged solar reflectance and thermal emittance, or a minimum SRI) may be required by Package A.

NOTE: Exceptions include (1) additions of 300 ft2 or less, (2) low-slope roofs (pitch 2:12 or less) in climate zones 1-12, 14 and 16; (3) steep slope roof (pitch greater than 2:12) in climate zones 1-9 and 16; (4) roof constructions that have thermal mass over the roof membrane with at least 25 lb/ft2; and (5) any roof area covered by building integrated photovoltaic panels and solar thermal panels (the area of roof not covered by photovoltaic panels would still need to meet any applicable cool roof requirements).

1. Mass roof 25 lb ft2 or greater: Mass roofs are not required to have a cool roof even if the climate zone specifies minimum performance requirements.
2. Roof Pitch: Expressed as 4:12, for example, which means the roof rises 4 foot within a span of 12 feet. When roofs have multiple pitches the requirements are based on the pitch of 50% or more of the roof.

3. The CRRC Product ID Number is obtained from the Cool Roof Rating Council's Rated Product Directory at www.coolroofs.org/products/search.php. Products are listed by manufacturer, brand, type of installation, roofing material, and color, as well as product performance.
4. Product type: See Cool Roof Rating Council's directory. Generally product types include single-ply roof, wood shingles, asphalt roof, metal roof, tile roof.
5. Proposed Aged Solar Reflectance: Value is from the Cool Roof Rating Council's Rated Product Directory. If the aged value is not available, calculate the SRI using the initial solar reflectance on CF-1R-PRSC-WS-04 (Cool Roof and SRI Worksheet).
6. Proposed Thermal Emittance: From the product specifications. Skip this value if using a calculated SRI.
7. Proposed SRI: It is optional to meet either the SRI or the solar reflectance/thermal emittance. To calculate the SRI value use calculation from http://www.energy.ca.gov/title24/. Enter the resulting value in the SRI Column above and attach a copy of the WS-04.
8. Minimum Required Aged Solar Reflectance: Based on climate zone and roof slope.
9. Minimum Required Thermal Emittance: Based on climate zone and roof slope.
10. Minimum SRI: Based on climate zone and roof slope.
11. Comments: Any notes regarding location, unique conditions, or attachments, such as an SRI worksheet.

If the cool roofing requirements will be met by a liquid field applied coating, Section 110.8(i)4 requires the coating be applied across the entire roof surface and meet the dry mil thickness or coverage recommended by the manufacturer.

H. FENESTRATION/GLAZING AREAS ALLOWED

The climate zone and size of the addition will affect the amount of fenestration (also known as glazing) allowed. If limited to 20%, this is calculated as Conditioned Floor Area x 0.20 = total ft2 of fenestration allowed (20%). Fenestration areas are expressed in feet, not inches. When west-facing fenestration is limited (in climate zones 2, 4, and 6-16), it is limited to a maximum of 5%. Additions of 1,000 ft2 or less have alternate requirements. For example, the limit may be 120 ft2 of fenestration or 25%. While west-facing fenestration may be limited, if there is no west fenestration the upper limit remains at 120 ft2 or 25% (or the values shown in columns 2 and 3).

1. Azimuth (or orientation). This separation of fenestration by orientation is needed only for west-facing fenestration in climate zones 2, 4 and 6-16.

   The remaining fields will be completed based on climate zone and conditioned floor area of the addition.

Maximum allowed is the greater of the value in column 2 or 3.

2. Maximum Allowed (based on percent of conditioned floor area): If West-facing fenestration is limited two rows will appear. West-facing fenestration area is limited to 5%, and the maximum total fenestration area is 30% for additions up to 400 ft2, 25% for additions greater than 400 ft2 but no greater than 700 ft, and 20% of greater than 700 ft2.

3. Maximum Allowed ft2: If West-facing fenestration is limited, it is limited to 60 ft2 for additions of 700 ft2 or less, or 70 ft2 for greater than 700 ft2. Other orientations (or the total in the addition) are limited to 75 ft2 for additions up to 400 ft2, 120 for additions greater than 400 ft2 but no greater than 700 ft, and 175 ft2 for additions of greater than 700 ft2.

	≤ 400 ft2		≤ 700 ft2		> 700 to ≤ 1,000 ft2	
Azimuth	**Percentage**	**Area**	**Percentage**	**Area**	**Percentage**	**Area**
West	5%	30	5%	60	5%	70
All Orientations	30%	75	25%	120	20%	175

NOTE: West includes any vertical fenestration oriented to within 45 degrees of true west (in either direction), including 45 degrees south of west, any skylights oriented west, and skylights facing any direction with a pitch of less than 1:12.

The values in these fields will be entered into Section I.

4. U-factor: Maximum U-factor from Package A. This field will always be 0.32. See notes for exceptions when completing Section I.
5. SHGC: Maximum SHGC from Package A. This field will either be 0.25 or N/A, depending on the climate zone. N/A means there is no maximum SHGC required in this climate zone. See notes for exceptions when completing Section I in climate zones requiring a maximum SHGC.
6. Comments: Any notes regarding location, unique conditions, or attachments.

I. FENESTRATION/GLAZING PROPOSED AREAS AND EFFICIENCIES

1. Fenestration Type: Window, glass door, skylight, or glass block.
2. Fame type: Vinyl, wood, metal, metal thermal break, clad, fiberglass, or none.
3. Azimuth: Orientation (North, East, South, West) or in degrees. In climate zones where the West-facing glazing is limited, list West-facing individually.

4. Proposed West Facing Area ft2: The size of any windows, doors with glass, or skylights within the floor area of the addition (combine windows with the same characteristics). West orientation includes any vertical fenestration oriented to within 45 degrees of true west, including 45 degrees south of west, any skylights oriented west, and skylights facing any direction with a pitch of less than 1:12.

   NOTE: Doors with glazing are counted in one of two ways. A door with 50% or more glazing is counted as the entire door area. A door with less than 50% glazing can be counted as the entire door area or can be calculated as the actual glass area with a 2-inch (0.17 ft) frame all around.

5. Proposed West Facing Area ft2: The size of any windows, doors with glass, or skylights within the floor area of the addition (combine windows with the same characteristics).
6. Total Proposed Area All Orientations: See row d below.
7. U-factor: Enter (a) the NFRC U-factor based on the proposed brand and type of fenestration using National Fenestration Rating Council (www.nfrc.org) certified values, (b) the default value from Table 110.6-A, or (c) the weighted average U-factor calculated on form CF-1R-PRSC-WS-02, Area Weighted Average Calculation Worksheet. If any products (other than the exceptions) have a higher U-factor than 0.32, first complete a WS-02 to calculate a weighted average U-factor and attach it to the CF-1R.

   NOTES: (1) An exception allows up to 3 ft2 of tubular skylights and up to 3 ft2 of glazing in a door without having to meet a maximum U-factor. This field can be N/A. For up to 16 ft2 of skylight, this value can be 0.55 or less.

   (2) If any fenestration has a U-factor greater than the maximum, with the exception of the 3 allowances for tubular skylights, glass in door, and skylights with 0.55 or less, complete a WS-02 and attach it to the CF-1R. If adding fenestration in climate zones with a maximum SHGC requirement, and any fenestration has an SHGC greater than required (with the exception of the 3 allowances for tubular skylights, glass in door, and skylights with 0.55 or less), complete a WS-02 and attach it to the CF-1R.

   (3) Dynamic glazing is a glazing system that changes its performance U-factor and SHGC based on the physical environment. Dynamic glazing includes chromogenic glazing or integrated shading systems (this does not include internally or externally mounted shading devices). If using dynamic glazing, use the lowest tested U-factor and SHGC in Columns 7 and 9.

8. Source: The source of the U-factor data for the fenestration product can be NFRC, Default, or WS-02.

9. Exterior Shading Device: If exterior shading devices are used to meet the SHGC requirement, indicate the type of device (from Table S-1 of CF-1R-PRSC-WS-03 Solar Heat Gain Coefficient Worksheet) and attach a WS-03.

   NOTE: South Overhang. If using an overhang for south-facing glazing, the glazing must be fully shaded at solar noon on August 21 and substantially exposed to direct sunlight at solar noon on December 21 (see Residential Manual, Section 3.___).

10. Comments: Note any special location or comment here.

To determine compliance with allowable fenestration areas, complete rows a-g.

a. Added West-facing Fenestration Area: If limited, enter the total amount of west-facing fenestration ONLY that will be in the addition's floor area.
b. Maximum Allowed West-facing Fenestration Area: From Section H (greater of column 2 or 3.
c. Is West-facing Fenestration Area $\leq$ Allowed: Indicate Yes if west-facing fenestration area is less than or equal to the maximum area allowed. If No another compliance approach must be used.
d. Added Fenestration Area (all orientations): This field is to show the area of fenestration for all orientations within the floor area of the addition.
e. Maximum Allowed Total Fenestration Area (all orientations): From Section H (greater of column 2 or 3.
f. Is Total Proposed Fenestration Area $\leq$ Allowed: Indicate Yes if the total fenestration area is less than or equal to the maximum area allowed. If No another compliance approach must be used.
g. If exterior shading devices are used to meet the SHGC requirements, enter the value calculated on the WS-03 and attach it to the CF-1R.

J. HVAC SYSTEMS – HEATING/COOLING

If an existing space system will condition an addition, the prescriptive requirements do not apply to that system (Exception 4 to Section 150.2(a)). The enforcement agencies may require verification that the capacity of the existing heating system is adequate to meet the added load of the additional conditioned floor area. Since there is no health and safety code requirement to provide cooling, the enforcement agency will not ask for verification that the capacity of the existing system is adequate to meet the added load of the additional conditioned floor area.

If a new system is installed complete the following section.

1. Alteration type: Select "New" if a new system will serve the addition alone, or "Replace" if a new system is being installed to condition the existing and new space.
2. Area to be heated/cooled (ft2): Indicate the conditioned floor area that the system will be heating and/or cooling.
3. Heating system type: Type includes furnace, central heat pump, boiler, hydronic, wood heat, wall furnace, room heater, room heat pump, or electric resistance (if it meets the exception). An exception to Section 150.1(c)6 allows electric resistance heating only when it is supplemental to another system, as indicated by a capacity of < 2 KW or 7,000 Btu/hr, and has a time-limiting control device that allows it to be operated for 30-minutes at a time.
4. Heating efficiency: For central gas heating systems, the minimum efficiency required by the appliance efficiency standards is 78% AFUE. Heat pumps have an HSPF of 7.7 or higher. Other appliance types will have different efficiency levels (e.g., a gas wall furnace may have a minimum requirement of 73% AFUE or lower, depending on the size and type). Any gas heating appliance (or heat pump) sold in California is acceptable. The only electric heating appliance allowed is a heat pump.
5. Cooling System Type: Indicate cooling system type or specify "no cooling." Categories include central air split system, central air package system, heat pump, room air or room heat pump, mini-split heat pump, or no cooling.
6. Cooling efficiency: For central cooling systems, the minimum efficiency required by the appliance efficiency standards is13 SEER. Other appliance types will have different efficiency levels (e.g., a room air conditioner may have a minimum requirement of 9 EER (when an appliance standard is an EER this is considered equivalent to an SEER). Any cooling appliance sold in California is acceptable.
7. Thermostat type: Select a setback thermostat or an Energy Management System (EMS) for most systems, or N/A if exempt. Controls for most systems can be by a device that allows a person to program up to 4 temperature setpoints within 24 hours. See Section P.1 for more information and for a list of systems that do not have to meet the setback thermostat requirements.
8. Comments: Any notes regarding location or unique conditions.

NOTE: Ventilation Cooling or a whole house fan (a prescriptive requirement in climate zones 8-14) is not required for additions less than or equal to 1,000 ft2. Other mandatory requirements still apply.

K. DUCT SYSTEMS

If an existing heating/cooling system is being extended to serve the addition, if less than 40 feet of new or replacement duct work is installed in either unconditioned or indirectly conditioned space (such as an attic or crawlspace) then no duct requirements are triggered. If that is the case only mandatory requirements apply. If prescriptive duct requirements are triggered, Exception 5 to Section 150.2(a) requires the existing

duct system and the extended ducts to meet applicable requirements of the alteration requirements. The HERS Rater will know what requirements apply for duct leakage testing.

1. Duct Alteration Type: Select Extend (if extending the ductwork from an existing system, New (if a new system is being installed for the addition only) or Replace (if a replacement system will serve an area larger than the addition alone).
2. Distribution System Type: Select ducted, radiant floor, piping, or ductless.
3. Duct location: If the system has ducts, indicate where they will be installed. Locations include attic, garage, conditioned space, radiant floor.
4. Added Duct Length: Indicate if Less than 40 feet of duct or more than 40 feet of duct is being added or replaced. Indicate only ducts in unconditioned space.
5. Duct R-value: From Package A. Ducted systems in Climate Zones 1-10 and 12-13 require R-6 duct insulation, and in climate zones 11 and 14-16 ducted systems require R-8 duct insulation. If ducts are installed in conditioned space (which must be field verified), this field will be N/A. If system is ductless this field will be N/A.
9. Comments: Any notes regarding location or unique conditions.

NOTE: When duct sealing to an existing duct system is triggered by the changes being made, a narrow exception is provided only when the existing duct system is constructed, insulated or sealed with asbestos.

L. WATER HEATING SYSTEMS FOR ADDITIONS

Water heating compliance for an addition ranges from options found in Section 150.2(a) to using any of the prescriptive options found in Section 150.1(c)8. When a water heater is added as part of an addition, there is a very simple option of adding a gas or propane water heater, 60 gallons maximum (typically 50), or tankless. There is also a provision for adding an electric water heater but only if the existing fuel type is electric. Changing from gas to electric is not allowed, unless the new water heater is a heat pump water heater (which meets Section 150.2(b)1Giii).

1. Existing Fuel Type: Gas, Propane or Electricity.
2. Proposed Fuel Type: Gas, Propane or Electricity.

NOTE: Electricity is only allowed if (a) the existing water heater fuel type is electric, (b) if the proposed water heater type is a heat pump water heater, or (c) the electric storage or tankless water heater is located inside the conditioned space, has no

recirculation pumps, and has a solar water-heating system sized to meet 50% of the water heating requirements (see Residential Manual). Otherwise, this compliance approach cannot be used and computer performance compliance is required.

3. DHW (domestic hot water) Water Heater Type: select storage, tankless, heat pump, or central (for multi-family).
4. Number of Added Water Heaters: This approach allows only one added water heater.
5. Dwelling Unit Distribution Type: Select standard or recirculating with manual demand control. No other recirculating systems are allowed unless the system is central serving a multi-family building.
6. Water Heater Volume: Up to 60 gallons allowed for storage water heaters. For tankless enter n/a.
7. Rated Input (btuh): Storage gas water heaters must be 75,000 Btuh or less. Tankless gas water heaters must be 200,000 Btuh or less.
8. Energy Factor: Enter the Energy Factor of the proposed water heater. The federal minimum Energy Factor for storage gas water heaters varies by tank volume. For a small water heater (75,000 Btu input or less for storage, 200,000 Btu input or less for tankless), the minimum energy factor is 0.58 for 50 gallons, 0.59 for 40 gallons, 0.61 for 30 gallons. Tankless water heaters will have an Energy Factor of 0.62 or higher, and heat pump water heaters have an energy factor of 2.0 or higher.
9. Required Water Heater Tank Exterior Insulation: Indicate the blanket R-value. If a water heater does not exceed the federal minimum standard, an external R-12 wrap is required. The federal minimum Energy Factors are 0.575 for 50 gallons, 0.594 for 40 gallons, and 0.613 for 30 gallons.
10. Comments: Make any notations about conditions.

OPTIONAL – if the proposed water heating does not meet these requirements, it may be able to comply with the requirements applicable to new construction.

M. WATER HEATING SYSTEMS FOR NEW CONSTRUCTION

If the proposed added water heater does not meet the requirements of Table L, there are other options available in Section 150.1(c)8 that can be used for additions.

1. Standards requirement being met (A, B, C (central water heating), or D) from Section 150.1(c)8 (see Section Q.2 for more detailed information on these requirements):
    A. One gas or propane storage water heater, up to 75,000 Btu/hour input (typically 50 gallons or less). Distribution system is either standard (no recirculating system) or a demand recirculation system with manual controls.

   B. One gas or propane instantaneous (tankless) water heater. Distribution system is either standard (no recirculating system) or a demand recirculation system with manual controls.
   C. A central gas or propane water-heating system that has includes a recirculating system with specific controls and a solar water heating system (the size of which varies by climate zone).
   D. If natural gas is not available, an electric-resistance storage or instantaneous water heater with additional criteria that it be located inside the conditioned space, has no recirculation pumps, and has a solar water-heating system.
2. Water heating system type: DHW, hydronic, combined hydronic, central. DHW is for domestic hot water, hydronic or combined hydronic are when a boiler or tankless water heater will provide space conditioning (hydronic) or both space conditioning and domestic hot water (combined hydronic), or central if a central water heater will serve multiple dwelling units in a multi-family building.
3. DHW Water Heater Type: Storage, tankless, instantaneous, heat pump, boiler.
4. Fuel Type: Gas, LP (propane), electric (special conditions apply, see M.1.D and Q.4.D).
5. Dwelling Unit Distribution Type: This may be standard (meets mandatory requirements), or a recirculating system. Requirements vary as to which type of recirculating system is allowed. In individual dwelling units with gas or propane water heating the only allowable recirculating system is demand with manual controls. If the system serves multiple dwelling units, see 1.C above.
6. Number of water heaters in system: In single-family dwelling units, this value is 1. For multifamily it can vary from 1 per dwelling unit to 1 central system serving multiple dwelling units.
7. Water heater volume (gal): tank capacity in gallons. For most water heaters, this will be 50 gallons or less. Any storage water heater with an input of 75,000 Btu is allowed. If tankless or instantaneous, enter 0.
8. Rated input (Btuh): Storage gas water heaters must be 75,000 Btuh or less. Tankless gas water heaters must be 200,000 Btuh or less.
9. Standby Loss (percent): Applies only to boilers or large water heaters used for hydronic or combined hydronic systems.
10. Energy Factor or recovery efficiency: From product literature or a California Energy Commission directory.
11. External tank insulation: Indicate the blanket R-value. If a water heater does not exceed the federal minimum standard, an external R-12 wrap is required. The federal minimum Energy Factors are 0.575 for 50 gallons, 0.594 for 40 gallons, and 0.613 for 30 gallons.
12. Back-up solar savings fraction: If compliance requires a back-up solar system, indicate the solar contribution (e.g., 0.30). The system size requirements are shown below in Q.4. External calculations are required.

N. HERS MEASURES

HERS measures that are required will be listed in this section. A HERS rater will be required to complete inspections, verifications, or testing during construction of the addition. Possible verifications include:

1. Duct Leakage Testing: All duct systems must meet maximum duct leakage requirements. Typically the maximum leakage is 6% but varies for when the duct leakage test is performed and the type of building (single family, townhouse, multifamily). The only exception is if the heating and cooling systems are ductless.
2. Refrigerant Charge: Some type of refrigerant charge verification or Charge Indicator Display is required in climate zones 2 and 8-15 for most common systems such as ducted split and packaged systems, and mini-split systems. See Section 150(c)7.A. or Reference Residential Appendix RA3.2. If a building is built in climate zones 1, 3-17 or 16, or has no cooling system, no refrigerant charge verification is required.
3. Central System Air Handlers: Unless a building has no cooling system or has a non-ducted cooling system, the system must meet mandatory and prescriptive requirements for an airflow greater than 350 CFM per ton of nominal cooling capacity, and a fan efficacy less than or equal to 0.58 W/CFM. See 150.0(m)13, 150.1(c)10, and Reference Residential Appendix RA3.

O. DOCUMENTATION DECLARATION STATEMENTS

1. The person who prepared the CF-1R will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature (may be electronic).
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature (may be electronic).

P. REGISTRATION

The CF-1R must be registered with a HERS provider prior to submitting for a building permit. See _____.

Q. REFERENCES

1. Thermostats

Thermostat requirements are found in Section 110.2(c) with special requirements for heat pumps in Section 110.2(b). Controls for most systems can be by a central energy management control system ("EMS") or a setback thermostat with a mechanism allowing a person to program up to 4 temperature setpoints within 24 hours ("setback").

EXCEPTIONS: If the heating system type is a gravity gas wall, floor or room heater, non-central electric heater, fireplace or decorative gas appliance, or wood stove, a setback thermostat or energy management control system is not required.

If the cooling system type is a room air conditioner or room air conditioner heat pump setback thermostat or energy management control system is not required.

2. Water Heaters:

Section 150.1(c) allows a limited number of conditions for water heating. If conditions other than these are proposed, the prescriptive compliance approach cannot be used:

A. 150.1(c)8A one gas or propane storage water heater, up to 75,000 Btu/hour input (typically 50 gallons or less), with either no recirculating system or a demand recirculation system with manual controls. If the Energy Factor is less than or equal to the federal minimum, it must have an R-12 external wrap. See D. below.
B. 150.1(c)8B one gas or propane instantaneous (tankless) water heater with an input of 200,000 Btu per hour or less, no storage tank, and either no recirculating system or a demand recirculation system with manual controls. .
C. 150.1(c)8C a central water-heating system that has includes the following components (1) gas or propane water heaters, boilers or other water heating equipment, (2) a water heating recirculation loop that meets the requirements of Section 110.3(c)2 and Section 110.3(c)5 equipped with automatic controls for the recirculation pump based on measurement of hot water demand and hot water return temperature, and if more than 8 dwelling units, two recirculation loops each serving half of the building; (3) a solar water-heating system with a minimum solar savings fraction of 0.20 in climate zones 1 through 9 or a

minimum solar savings fraction of 0.35 in climate zones 10 through 16 (installation criteria is in Reference Residential Appendix RA4).

D. 150.1(c)8D if natural gas is not available, an electric-resistance storage or instantaneous water heater with addition criteria that it be located inside the conditioned space, it has no recirculation pumps, and has a solar water-heating system with a minimum solar savings fraction of 0.50 (installation criteria is in Reference Residential Appendix RA4).